which is consistent with the pattern seen from the logistic regression analysis. In FOA, BMLs in the medial PFJ were more strongly associated with knee pain than were lateral PFJ BMLs, while neither compartment individually were associated with pain when defined by cartilage loss (Table 1). Similar results were observed when using WORMS >1 for BMLs and when removing knees with TFJ damage.

Conclusions: Pain was commonly reported in knees with either medial or lateral PFJ structural damage. Yet, despite the high prevalence of potentially pain-producing full-thickness cartilage loss and BMLs in the medial PFJ, knee pain was most prevalent and most severe among knees with damage that was either isolated to or inclusive of the lateral PFJ. These findings have implications for treatments that seek to reduce knee pain by altering load distribution over the medial and lateral PFJ.

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THE EFFECT OF A PATELLAR BRACE ON PATELLA POSITION USING WEIGHT BEARING MAGNETIC RESONANCE IMAGING.

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Purpose: Isolated patellofemoral OA (PFOA) is associated with pain, stiffness and functional limitation. Non-surgical treatments for isolated PFOA include a PF brace which has been successful in clinical trials treating symptomatic PFOA. One of the proposed reasons for clinical success is that the brace may alter the position of the patella relative to the trochlear groove during weight bearing activities but this has not been examined *in vivo*. Weight bearing magnetic resonance images (MRIs) may give a more valid view of patellofemoral congruence and position under natural loads exerted by body mass. The purpose of this study was, using weight bearing MRIs to assess whether a patellar brace altered patellar position and alignment. The hypothesis was that there would be differences in patellar position when the brace was applied compared to no brace.

Methods: Subjects age 40-70 years old with knee pain were included if they had a radiographic K-L score grade 2 or 3 in the PFJ which was greater than K-L score for the tibiofemoral compartments. Subjects had symptomatic PFJOA defined as pain with stair climbing, kneeling, prolonged sitting or squatting and tenderness over lateral or medial patellar facet on palpation or a positive patellar compression test. Pain was present daily for the previous 3 months and above a score of 40 on a 0-100mm VAS for their nominated most aggravating activity.

Weight bearing MRIs of their knee joints were obtained using an upright open 0.25 Tesla scanner (G-Scan, Easote Biomedica, Italy). Scans had TE range of 690 - 830ms and TR range of 14-28ms with a slice thickness of 4mm. Each participant had MRIs with and without a Bioskin patellar tracking Q brace (Ossur UK, Manchester England)

Axial and sagittal weight bearing images were assessed in 10 degrees of knee flexion. MRI assessors were blinded to brace or no brace conditions. Using medical imaging software (Clear Canvas Workstation Version 7.0.0), we measured five aspects of patellar position: mediolateral alignment by the bisect offset index, angulation by patellar tilt, patellar height by patellar height ratio (patellar length / patellar tendon length), lateral patellofemoral contact area and finally a measurement of patellofemoral bony separation of the lateral patellar facet and the adjacent surface on the femoral trochlea (Figure 1).

Data were visually analysed with histograms, Q-Q plots and Kolmogarov-Smirnov tests which confirmed normality of distribution. Inter rater reliability was assessed between two MRI assessors. Main analysis used paired t tests comparing patellar position within subject with and without brace on. Statistical significance was set at $p \leq 0.05$.

Results: Thirty participants were recruited (mean age 57 SD 27.8; BMI 27.8 SD 4.2); 17 were females. Four patients had non-usable data either because of missing data on some parameters or because of technical problems.

For patellar tilt $ICC_{2,1}$ was 0.95 (SEM 1.07 degrees p =< 0.001), for bisect offset index $ICC_{2,1}$ 0.95 (SEM 0.316,$p < 0.001$) for patellofemoral separation ($ICC_{2,1}$ 0.87, SEM 0.094, $p< 0.001$), for patellar height ratio ($ICC_{2,1}$ 0.69, SEM 0.07, $p=0.01$) and for patellofemoral lateral contact area $ICC_{2,1}$ 0.73 SEM 0.031, $p = 0.01$).

For bisect offset index, patellar tilt and patellar height ratio there were no significant differences between the brace and no brace conditions. However, the brace increased lateral facet contact area ($p =.04$) and decreased lateral patellofemoral separation ($p = .03$) (Table 1)

Conclusions: A patellar brace alters patellar position and increases contact area between the patella and femoral trochlea. These changes would lower contact stress at the PFJ. Such changes in patella position in weight bearing provide a possible biomechanical explanation for the success of the PF brace in clinical trials on PFOA.

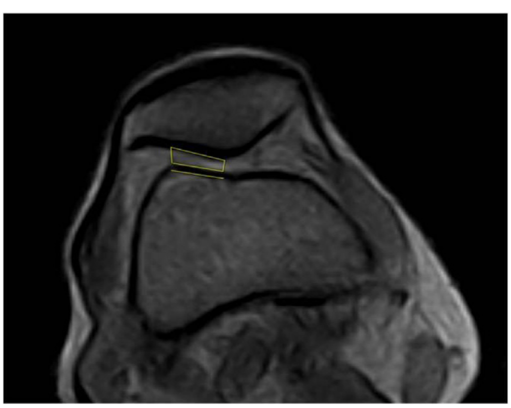

Figure 1. Measurement of patellar separation: Area A/ Length B measured on axial slice where patellar separation smallest. This measures the distance between the bone of the lateral patellar facet and the bone of the femur.

Table 1
Results

	Patellar tilt Mean (SD) N = 27	Bisect offset Index Mean (SD) mm N = 27	Patellar length/tendon length ratio Mean SD N = 27	Patellofemoral Lateral Contact area Cm^2 Mean SD N = 36	Patellofemoral Separation Cm Mean SD N = 26
Brace	8.63 SD 6.6	72.4 SD 19.1	1.0 SD 0.17	2.73 SD 2.4	0.27 SD 0.12
Mo Brace	8.39 SD 4.9	73.8 SD 18.4	0.96 SD 0.13	1.79 SD 2.2	3.33 SD 3.13
Mean difference	-0.25 (95% CI - 1.61, 1.1)	1.39 (95% CI – 2.3, 5.1)	0.05 (95%CI-0.01, 0.11)	0.94 (95% CI 0.07, 1.81)	-0.062 (95% CI – 0.12, -0.01)
P value	0.71	0.44	3.03	0.34	0.33

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MRI SIGNS OF INFLAMMATION IN HAND OSTEOARTHRITIS: ITS ASSOCIATION WITH PAIN

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Purpose: The underlying mechanisms leading to pain in hand osteoarthritis (OA) remain unclear. Several ultrasonography studies have demonstrated that joint specific abnormalities such as synovitis may contribute to the presence of pain. Magnetic resonance imaging (MRI) is not only able to visualize synovitis and tenosynovitis, but also bone marrow lesions (BML), another feature which has shown to be associated with pain. The objective of this study was to examine the association between MRI features and pain.

Methods: Cross-sectional data were used of the ongoing HOSTAS (Hand OSTeoArthritis in Secondary care) study, in which consecutive patients are included, who are diagnosed by the treating rheumatologist with primary hand OA. For the present analysis, patients were included who received a contrast enhanced MRI of the distal interphalangeal (DIP) 2-5 and the proximal interphalangeal (PIP) 2-5 joints of the right hand. Participants underwent physical examination to assess the number of joints painful upon palpation (0-30). Pain in the right hand was assessed